

***Myrmica cagnianti*, a new ant from North Africa (Hymenoptera, Formicidae)**

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Myrmica cagnianti, a new ant from North Africa (Hymenoptera, Formicidae)– *Myrmica cagnianti*, a Moroccan ant, is proposed as a new species. It is characterized by its scape without lobulated extension, fine pilosity, absence of tibial spurs II and III and the shape of the petiole node. Differences from *M. aloba* Forel, *M. speciosus* Bondroit and *M. scabrinodis* Nylander are described. The males of this new species are very similar to *M. scabrinodis* males. Cephalic indices provide a good way to discriminate between *M. cagnianti* and related species. The social parasite *Myrmica kabylica* (Cagniant) has been found in a nest of this new species, constituting the second record for this rare ant.

Key words: *Myrmica*, New species, Formicidae, Maghreb.

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Introduction

Several *Myrmica* species from North Africa have been recorded. These include *M. aloba* Forel from Morocco (SANTSCHI, 1931a, 1936, 1939; COLLINGWOOD, 1963) and Tunis (SANTSCHI, 1931b); *M. rubra* L. from the Higher Atlas (CAGNIANT, 1962); *M.*

ruginodis Nylander from Tebessa (SANTSCHI, 1910); *M. scabrinodis* Nylander from Tebessa (FOREL, 1890) and from Tonga Lake, Algeria (CAGNIANT, 1969); *M. sabuleti* Meinert was referred to as a tramp species in North Africa (EMERY, 1921); *M. rolandi* Bondroit (a synonym of *M. scabrinodis*; SEIFERT, 1988) from Tunis

(SANTSCHI, 1925, 1929). However, SANTSCHI (1936) himself doubted the identification of *M. aloba* in the absence of males and there is also doubt about the correct identification of some of the older records of this and other species, some of which at least should probably be referred to the new species proposed here.

True *M. aloba* is a common Iberian species. Recent capture of sexuals with associated workers have made a fuller description possible (TINAUT & ESPADALER, 1987). Abundant Iberian material compared with samples taken at Oukaïmeden, Higher Atlas, Morocco, appear to differ at specific level. The new species, with the scape having no lobar extension at the bend is so reminiscent of that of *M. aloba* that it may be advisable to check all previous African material. Citations of *M. aloba* from Algeria (CAGNIANT, 1968, 1973) correspond to this new species.

Material and Methods

Measurements were made with a Nikon binocular microscope and scaled eyepiece, accurate to 0.025 mm (table 1).

Indices used are those of ARNOLDI (1934):

- Head Index: width of the head at the anterior margin of the eyes $\times 100$ / length of the head;

- Frontal Index: width of the forehead $\times 100$ / width of the head;

- Frontal laminae Index: width of the forehead $\times 100$ / width of the frontal laminae.

- Buschinger's Index: distance from propodeal spiracle to the tip of the spines / distance from propodeal spiracle to the descent face of propodeum in profile.

Results

Myrmica cagnianti n. sp.

Worker (figs. 1, 2, 5, 6)

Lg 3.7-4.7 mm; general habitus of most European *Myrmica*. Colour of workers one

year or less: head, thorax, legs and pedicels reddish brown; gaster dark brown. Older workers: head, thorax and gaster dark brown; legs and pedicels reddish brown. Pilosity finer and longer than in *M. aloba* and other European *Myrmica* (15 species compared), specially on the gaster.

Scape sharply bent near the base, without any lobar extension; scape thinner than in *M. aloba*. External border of scape with preponderantly subdecumbent hairs. Head indices, see table 2. Frontal triangle smooth and shining in the first 2/3, with 1-4 short striae at the apex. Dorsal median surface of the head longitudinally striate, becoming reticulate laterally; species between frontal striae smooth and shining; spaces between lateral reticle, superficially sculptured.

Thorax longitudinally striate, the spaces between striae smooth and shining; propodeal spines long, fine and slightly curved downwards when viewed from side and diverging from above. Mesopropodeal furrow shallow. Tibial spurs from middle and hind legs very poorly developed, nearly absent; in a few examples from Algeria the spurs may be near normally developed. Petiole in profile with distinctly concave anterior face, similar to *M. specioïdes* Bon-droit; the node sloping backwards from the dorsal crest, without a distinct step; viewed from above its sides converge anteriorly. Postpetiole globose to sub-elliptical from above, distinctly wider than the petiole; postero-dorsal face of petiole finely reticulate rugose; post-petiole rugose with striae converging posteriorly. Gaster smooth and shining.

Female (fig. 3)

Lg 5.8-6.0 mm; colour similar to the worker but the head darker, specially the clypeus and front, and two dark parapsidal strips and a middle anterior zone of scutum, posterior border of scutum and a dark spot at the posterior zone of the anepisternum. Pilosity very fine, as in workers.

Scape, clypeus and head sculpture as in workers; head indices, see table 2. Thorax

Table 1. *Myrmica cagniantl* n. sp. Means and standard deviation of eight characters measured on workers (w; n = 47), queens (f; n = 9) and males (m; n = 4).

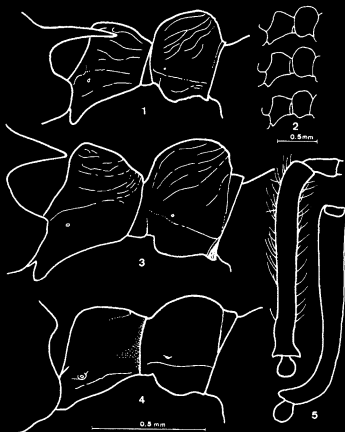
Myrmica cagniantl sp. n. Media y desviación estándar de ocho caracteres medidos en obreras (w, n = 47), reinas (f; n = 9) y machos (m; n = 4).

Characters	mean	s.d.	ratio to head width	s.d.
Head width behind eyes				
w	0.815	0.025	1	0
f	1.025	0.010	1	0
m	0.731	0.037	1	0
Head length				
w	1.050	0.052	1.195	0.020
f	1.201	0.018	1.170	0.020
m	0.790	0.027	1.081	0.202
Frons width (minimum)				
w	0.380	0.019	0.432	0.014
f	0.459	0.012	0.448	0.009
Scape length				
f	0.916	0.012	0.894	0.013
m	0.306	0.031	0.418	0.036
Thorax width				
f	0.988	0.013	0.964	0.014
m	0.812	0.059	1.111	0.056
Petiole width				
f	0.343	0.011	0.334	0.012
m	0.303	0.006	0.415	0.019
Postpetiole width				
f	0.531	0.011	0.519	0.011
m	0.431	0.012	0.591	0.042
Postpetiole height				
f	0.538	0.018	0.525	0.017
m	0.459	0.011	0.629	0.034

longitudinally rough, brilliant between rugae; spines somewhat shorter than in the worker (see Buschinger's index, table 2).

Tibial spurs comparatively less developed than in *Myrmica* queens. Wings with

infuscated basal half and brownish veins. Closed discoidal cell and half partitioned cubital cell. Petiole and postpetiole similar to the worker but the dorsal face of the node with a small step in side view.



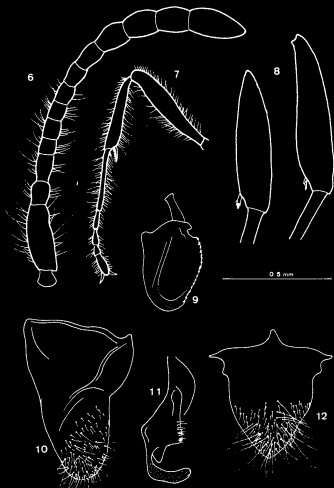
Figs. 1-5. *Myrmica cagnianti* n. sp.: 1. Petiole and postpetiole of worker, side view, pilosity omitted; 2. Three examples from the same colony; 3. Petiole and postpetiole of female, side view, pilosity omitted; 4. Petiole and postpetiole of male, side view, pilosity omitted; 5. Scape of worker, upper and frontal view.

Myrmica cagnianti sp. n.: 1. Peciolo y pospeciolo de la obrera, vista lateral, se omite la pilosidad; 2. Tres ejemplos de la misma colonia; 3. Peciolo y pospeciolo de la hembra, vista lateral, se omite la pilosidad; 4. Peciolo y pospeciolo del macho, vista lateral, se omite la pilosidad; 5. Escapo de la obrera, vista superior y frontal.

Male (figs. 4, 6, 7, 9-12)

Lg 4.2-4.6 mm; head and thorax brownish; coxa, trochanter, femur, tibia, petiole, postpetiole and gaster slightly lighter;

antennae, mandibles and tarsi brownish yellow. Abundant long hairs on all appendages, longer than their maximum width; hind tarsal hairs subequal on all



Figs. 6-12. *Myrmica cagnianti* n. sp.: 6. Male antenna; 7. Front leg of male; 8. Mid and hind tibiae of worker showing reduced spurs, pilosity omitted; 9. Aedeagus; 10. External paramera; 11. Volsella; 12. Subgenital plate.

Myrmica cagnianti sp. n.: 6. Antena del macho; 7. Pata anterior del macho; 8. Tibias media y posterior de la obrera mostrando espolones reducidos, se omite la pilosidad; 9. Edeago; 10. Parámetro externo; 11. Volsella; 12. Placa subgenital.

Table 2. *Myrmica cagnianti* n.sp. Biometrical indices. Mean (s.d.).

Myrmica cagnianti n. sp. Indices biométricos. Media (desviación estándar)

	Workers n=47	Females n=9
Indexes		
Head	83.63(1.45)	5.33(1.49)
Frontal	43.28(1.13)	4.84(0.98)
Frontal		
laminae	85.22(2.17)	88.97(1.73)
Buschinger's	2.91(0.16)	2.75(0.20)

surfaces.

Scape short, gently curved at the base, as long as the first three funicular segments; mandibles with 4-5 teeth; palpal formula 6:4. Head finely reticulate, submat. Mesoscutum smooth and shining between Mayrian furrows and with some median very fine longitudinal striae; scutellum smooth and shining in the middle, with some lateral rugae. Pronotum and episternum smooth and shining with some small striae at the upper part of the katepisternum; sides of propodeum with some longitudinal striae; propodeum bluntly indented, with space between angles smooth and shining. Wings as in females.

Petiole in side view with anterior face forming a right-but rounded- angle with posterior face; petiole and post-petiole smooth and shining; post-petiole higher than wide. Gaster smooth and shining.

Genitalia. Without any distinctive feature. Subgenital plate with 90-100 hairs at the distal border; external paramera with 60-80 short hairs; ventral border of the volsella with 15-19 short setae; serrated edge of aedeagus with 17-21 teeth.

Type material

Holotype: worker, Morocco, Oukaïmeden, Higher Atlas, from a colony collected under stone at 2450 m, near a small stream, 12 V 1983, Espadaler leg. in author's collection. Paratypes: 46 workers, 18 females, four males, Morocco, Oukaïmeden, Higher Atlas, from a colony collected under stone at 2450 m, near a small stream, 12 V 1983, Espadaler leg.

Other material

One worker, two females from Oukaïmeden, at 2600 m, near artificial reservoir, 12 V 1983; one female from Higher Atlas, V 1981, Cagniant leg; many workers nesting in soil on a prairie near an artificial reservoir at Ifrane, Middle Atlas, 20 V 1985; many workers under stone in a cedar wood at 1950 m in the Michliffen crater, near Azrou, Middle Atlas, 20 V 1985; 20 workers under a stone in a clearing in a cedar wood at 1650 m near Ktama, Rif zone, 27 V 1986; many workers and females from a nest under stone in a pasture at 2100 m in the Bou Iblane, Middle Atlas, 18 V 1987; 25 workers, one female collected under a stone at 2050 m near a mountain stream at the Erdouz massif, Higher Atlas, 2 V 1990; many workers and several winged females under a stone at 2400 m in the Toubkal massif, Higher Atlas, 4 V 1990; many workers and females from a nest partly under a big rock near a mountain stream at 2600 m in the Sirwa massif, Higher Atlas, 4 V 1990.

Two worker paratypes and one female at the following institutions: Museum of Comparative Zoology, Harvard; Muséum d'Histoire Naturelle, Genève; Muséum d'Histoire Naturelle, Paris; named after Prof. H. Cagniant, who has patiently helped the author in so many ways from his very beginnings as an ant taxonomist and introduced him to the rich myrmecofauna of Morocco.

Discussion

Taxonomic position

Workers have scapes similar to those of *M. aloba*. In *M. cagnianti* body size is smaller, the sculpture is longitudinal with the interspaces very shiny, the pilosity is finer and the meso-propodeal furrow less developed. The best way to discriminate the two species, besides cephalic indices, is by the near absence of tibial spurs and the shape of the petiole which is not truncated above in *M. cagnianti*. The petiole is also narrower in *M. cagnianti* [mean $\pm$ sd PE/HW (petiole width/head width): 0.24 ± 0.008 ; measured as in SEIFERT, 1988]. It differs from *M. scabrinodis* by its non angulate scape, the shape of the petiole and the cephalic indices and from *M. speciooides* also by its scape and cephalic indices.

Females of *M. cagnianti* differ from *M. aloba* by the scape petiole shape [PE/HW (petiole width/head width): 0.27 ± 0.008] and pilosity in similar ways as workers and from *M. scabrinodis* by the scape, petiole shape and cephalic indices.

Males of *M. cagnianti* differ from *M. aloba* by the shape of the petiole, which is like that of *M. scabrinodis* and the long appendage pilosity separates *M. cagnianti* from *M. speciooides*. They are smaller, with a relatively shorter head and narrower alitrunk but otherwise very difficult to separate from the similar *M. scabrinodis*.

The group of *Myrmica* species with bent scape without lobar extensions or with slight angle should be considered with care as separate new morphospecies may perhaps be recognized. Identification of species belonging to this group, if made with scarce material and in absence of winged forms, is difficult. Workers are extremely alike in spite of being structurally rich, and proper naming is very much helped with biometrical analysis.

Biological notes

M. cagnianti nests in humid spots, apparently in all mountain chains of Morocco and Algeria as could be expected for this genus in a dry region, except Anti Atlas. In May, nests have always been found in biotopes near permanent water streams.

Societies are polygynous (up to 34 queens in a nest from Oukaimeden).

The nest from Bou Iblane was heavily parasitized by *Myrmica kabylica* (Cagniant, 1970). In a non exhaustive search 38 males and 106 females were collected. This social parasite was previously known only from Tala Guilef, Algeria.

Resumen

Myrmica cagnianti, una nueva hormiga del norte de África (Hymenoptera, Formicidae)

Se propone a *Myrmica cagnianti*, una hormiga de Marruecos, como una nueva especie.

Se caracteriza por el escapo sin extensión lobulada, pilosidad fina, ausencia de espolones tibiales II y III y por la forma del nodo del peciolo (figs. 1-5, 6-12). Se describen las diferencias con *M. aloba* Forel, *M. speciooides* Bondroit y *M. scabrinodis* Nylander. Los machos de esta nueva especie son muy similares a los de *M. scabrinodis*. Los índices cefálicos constituyen un buen método para discriminar entre *M. cagnianti* y especies relacionadas.

El parásito social *Myrmica kabylica* (Cagniant) ha sido encontrado en el nido de esta nueva especie, constituyendo la segunda cita para esta rara hormiga.

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References

- ARNOLDI, K. W., 1934. Vorläufige Ergebnisse einer biometrischen Untersuchung einiger *Myrmica*-arten aus dem europäischen Teile des USSR. *Fol. Zool. Hydrobiol.*, 6: 151-174.
- CAGNIANT, H., 1962. Etude de quelques fourmis marocaines. Statistique provisoire des Formicides du Maroc. *Bull. Soc. Hist. Nat. Afr. Nord*, 53: 83-118.
- 1968. Liste préliminaire des fourmis forestières d'Algérie. *Bull. Soc. Hist. Nat. Toulouse*, 104: 138-147.
- 1969. Deuxième liste des fourmis d'Algérie, recoltées principalement en forêt. *Bull. Soc. Hist. Nat. Toulouse*, 105: 405-430.
- 1973. Les peuplements de fourmis des forêts algériennes. Ecologie, biocénose, essai biologique. Ph. D. Thesis, Université Paul Sabatier, Toulouse.
- COLLINGWOOD, C. A., 1963. Notes on some south european and mediterranean ants. *Ent. Rec.*, 75: 114-119.
- EMERY, C., 1921. Fam. Formicidae, subfam. Myrmicinae. In: *Genera Insectorum*. Fasc.: 174 (P. Wystman, Ed.). Bruxelles.
- FOREL, A., 1890. Fourmis de Tunisie et d'Algérie orientale. *Comp. Rend. Soc. ent. Belgique*, 34: 61-77.
- SANTSCHI, F., 1910. Nouvelles fourmis de Tunisie (suite). *Bull. Soc. Hist. Nat. Afr. Nord*, 3: 70-72.
- 1925. Fourmis d'Espagne et autres espèces paléarctiques (Hymenopt.) *Eos*, 1: 339-366.
- 1929. Fourmis du Maroc, d'Algérie et de Tunisie. *Ann. Bull. Soc. ent. Belgique*, 69: 138-165.
- 1931a. Fourmis du bassin méditerranéen occidental et du Maroc récoltées par M.M. Lindberg. *Soc. Sci. Fenn. Comm. Biol.*, 14: 1-13.
- 1931b. Notes sur le genre *Myrmica* (Latreille). *Rev. Suisse Zool.*, 38: 335-355.
- 1936. Liste et description des fourmis du Maroc. *Bull. Soc. Hist. Nat. Afr. Nord*, 16: 198-210.
- 1939. Trois notes sur quelques fourmis du Musée Royal d'Histoire Naturelle de Belgique. *Bull. Mus. Roy. Hist. Nat. Belgique*, 15: 1-7.
- SEIFERT, B., 1988. A taxonomic revision of the *Myrmica* species of Europe, Asia Minor and Caucasia. *Abh. Ber. Naturkundemus. Görlitz*, 62: 1-75.
- TINAUT, A. & ESPADALER, X., 1987. Descripción del macho de *Myrmica aloba* Forel, 1909 (Hymenoptera, Formicidae). *Nou. Rev. Ent.*, 4: 61-69.